COLORADO RIVER RECOVERY PROGRAM
FY 2010 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: 19b

I. Project Title: General Hydrology Support-(Grand Junction contribution)

II. Principal Investigator:

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III. Project Summary:

The Service's Division of Water Resources provides basic hydrology support to Recovery Program researchers and undertakes tasks to support the Recovery Program in basic data collection and monitoring projects. One task is the collection of water temperature data in various reaches of upper basin rivers. Temperature monitoring duties are divided between the Division of Water Resources Regional Office staff (Denver) and the Colorado River Fishery Project (CRFP), Grand Junction field station. The Grand Junction CRFP station currently collects water temperature data from five sites on the mainstem Colorado River, four sites on the Gunnison River and one site on the Uncompahgre River. These data, along with those collected by the Water Resources staff for the Green, Yampa and Gunnison rivers are assembled into a temperature database for use by Recovery Program researchers. Accomplishments for 2010 by the Grand Junction CRFP was the successful downloading of data from the various temperature monitoring stations.

In addition to downloading data, the CRFP PI for this project summarized Colorado and Gunnison River data sets for the period 1986-2005 and converted mean daily temperatures to annual thermal units for Colorado pikeminnow growth. Distributions of adult Colorado pikeminnow in the Gunnison and Yampa rivers were compared and upstream endpoints to distribution were found to occur at thermally similar locations. This information was then applied to the mainstem Colorado River to predict the extent of upstream range expansion of Colorado pikeminnow following construction of two fish ladders there. In addition, the degree of warming in the Gunnison River at Delta, Colorado (the upstream limit of critical habitat) required to bring temperatures there up to the level found at distribution endpoints was calculated. A manuscript describing these analyses was prepared over the last few years for submission to a scientific journal. In FY 2010, the article was accepted for publication in River Research and Applications. It has been published online and will appear in print in summer of 2011.

IV. Study Schedule: Initial Year - 1990, Final Year - Ongoing.

IV. Relationship to RIPRAP: Colorado and Green River Action Plans I.
Provide and protect instream flows.

VI. Accomplishments of FY 2010 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

A. Temperature Data Collection

Temperature data collection began in 1986 at two Colorado River stations, Palisade (rk 292.8) and Walker (rk 264.7). Over the years other sites have been added: Rulison in 1994 (rk 369.9), Dewey in 1994 (rk 154.5), Gold Bar in 1992 (rk 83.7) and The Slide upstream of the Green River confluence in 2000 (rk 2.9). A site on the Gunnison River at Peeple's Orchard (rk 63.9) was added in 1999; one downstream of the North Fork confluence (rk 117.5) was added in 2007, one at the NPS Never Sink recreation access area (just upstream of the Blue Mesa inflow) was added in 2007, and one just upstream of the confluence with the Uncompahgre River (rk 90.9) was added in fall 2008. These additional Gunnison River sites were added in an effort to provide better data for future temperature modeling efforts for management of Aspinal Unit releases. The Dewey site on the Colorado River was discontinued in 2007 when it was found that USGS had established their own temperature monitoring sensor at their streamflow gauging station.

In earlier years, data were recorded using TempMentor (Ryan Instruments, Redmond, Washington) thermographs. These units were later replaced with StowAway Tidbit (Onset Computer Corporation, Bourne, Massachusetts) temperature loggers (accurate to 0.2°C). Loggers are placed in sites where depth and velocity will safeguard against dewatering and shoreline warming. Data are downloaded 1—2 times annually. Mean daily temperatures (MDT) are calculated from readings taken every two hours and reported to the nearest 0.1°C. In recent years, a second, backup logger has been deployed at most sites to ensure data collection when loggers become lost, stolen, or sedimented in.

In 2005, all previously collected data were summarized as mean daily temperatures in Excel spreadsheets following the format used by USGS in their Water Resources Data yearbooks. The spreadsheets are then forwarded to Carrie Cordova of FWS Water Resources whom web enables them and links them to the Riverdata Web Page. The temperature data can be accessed and downloaded from the riverdata web page at http://www.r6.fws.gov/riverdata/ or by email request from FWS Division of Water Resources. GPS locations for each thermograph is available by request; for security purposes the exact locations are not provided on the web page.

VII. Recommendations:

The work provided is, for the most part, in support of other research projects or activities such as flow delivery, flow quantification, and habitat restoration, all of which have a direct impact on the recovery of the Colorado River endangered fish. We recommend continuation of the current data collection efforts at the established sites.

VIII. Project Status: Data collection is ongoing and on-track. Summarization of the data is currently behind schedule. For years 2006-2010, data collected at 2-hr intervals need to be converted to daily means and presented in annual spreadsheets for each site. The PI in Grand Junction intends to bring this summarization up to date this winter for the sites we are responsible for.

IX. FY 2010 Budget Status:

A. Funds provided:	$ 11,800
B. Funds expended:	$ 11,800
C. Difference:	$ 0

X. Status of Data Submission: Not applicable.

XI. Signed: *Doug Osmundson* October 29, 2010

Principal Investigator Date